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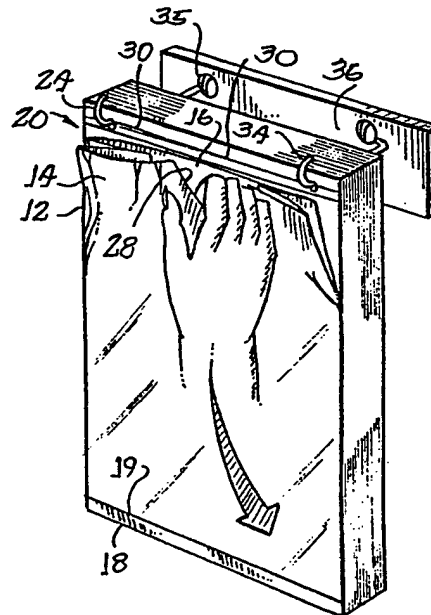
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(54) **Bag bundles and method of and apparatus for manufacture thereof.**

(57) A bag bundle is disclosed. The bundle comprises a plurality of plastic bags. Each such bag includes a first sidewall, a second sidewall integral with the first sidewall at lateral end portions thereof, a closed bottom, an opening in distal relation to the bottom and a tab. A longitudinal end portion of the first and second sidewalls defines the opening. The tab is integral with at least one of the first and second sidewall end portions adjacent the opening. The tab, moreover, is readily separable from such sidewall end portion because of the presence of a plurality of perforations formed in such sidewall end portion adjacent the opening. Only one of the first and second sidewalls includes a hand hole formed through such sidewall and to the tab. The bags are affixed together at their tabs in a stacked, folded manner, all such bag hand holes being uniformly disposed. The affixed tabs preferably include at least one support hole therethrough for securing the bag bundle to a support. Also disclosed is a method of and an apparatus for manufacturing the bag bundles.



BAG BUNDLES AND METHOD OF AND  
APPARATUS FOR MANUFACTURE THEREOF

BACKGROUND OF THE INVENTION

This invention relates to bags, and to a method of and an apparatus for, manufacture of such bags. More particularly, this invention relates to bundles of  
5 plastic bags, to the method of manufacture of such bundles and to an apparatus for manufacturing such bundles.

A traditional and long-accepted method for packaging  
10 merchandise, such as groceries at check-out counters, has generally included the loading of bags. Individual, flattened bags were generally piled, one atop another, up to a finite pile height. As a check-out person grasped an uppermost bag from such a  
15 pile, it was often difficult (for such a person) quickly to engage in a bag-loading procedure which included removing the uppermost bag from the pile, locating the uppermost bag opening, opening the bag and positioning the bag for receipt of goods. Such a  
20 bagging procedure thus was often inefficient, time consuming and expensive for the merchandiser. In the past, such bags had generally been made of paper.

Packaging goods in plastic bags, on the other hand, is  
25 now quickly becoming the preferred method of packaging merchandise. For example, a plastic handled bag has generally been encountered by the public at a variety

of check-out counters. Yet, many of such plastic bags, too, are generally known to be difficult quickly to open and load with goods. It is currently thought, for example, that charge builds up on the sidewalls of many plastic bags, such charge buildup causing the bag sidewalls to adhere together.

Many plastic bags, accordingly, may require a fixture for supporting the bag in an open position for rapid loading. See, for example, the 4,062,170 patent to Orem.

#### OBJECTS AND SUMMARY OF THE INVENTION

It is therefore a general object of this invention to provide a novel plastic bag which is readily openable and fillable.

A more specific object is to provide a bundle of such bags, such a bag bundle including a plurality of such bags uniformly disposed and fastened together at one end thereof.

A further object is to provide such a bundle having an uppermost or closest bag wherein a mouth or opening of such a bag is readily graspable for opening such bag.

Yet another object is to provide such a bundle wherein any individual bag (but preferably the uppermost or closest bag) is readily removable, as by a flip of the wrist, from the remainder of bags in the bundle.

A related object is to provide a method for the

manufacture of such a bag and bag bundle.

Another related object is to provide an apparatus for the manufacture of such a bag and bag bundle.

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Briefly, and in accordance with the foregoing objects, a novel bag bundle according to the present invention will now be summarized. The bundle comprises a plurality of plastic bags. Each such bag includes a first sidewall, a second sidewall integral with the first sidewall at lateral end portions thereof, a closed bottom, an opening in distal relation to the bottom and a tab. A longitudinal end portion of the first and second sidewalls defines the opening. The tab is integral with at least one of the first and second sidewall end portions adjacent the opening. The tab, moreover, is readily separable from such sidewall end portion because of the presence of a plurality of perforations formed in such sidewall end portion adjacent the opening. Only one of the first and second sidewalls includes a hand hole formed through such sidewall proximate to the tab. The bags are affixed together at their tabs in a stacked, folded manner, all such bag hand holes being uniformly disposed. The affixed tabs preferably include at least one support hole therethrough for securing the bag bundle to a support.

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The method of and apparatus for manufacturing bag bundles, according to the present invention, will be described below in greater detail.

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BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing, as well as other objects, features and advantages of the present invention will become more readily understood upon reading the following detailed description of the illustrated embodiments, together with reference to the drawings, wherein:

FIGURE 1 is a front perspective view of a first embodiment of the bag bundle of the present invention;

FIG. 1A is a front perspective view of a second embodiment of the bundle;

FIG. 1B is a front perspective view of a third embodiment of the bag bundle.

FIG. 2 is a perspective view illustrating removal of an uppermost or closest bag from the bag bundle of FIG. 1 by insertion of a hand into the bag hand hole and tearing along the perforations;

FIG. 3 is a perspective view of an individual bag (of the first embodiment), partially opened;

FIG. 4 is a top view taken substantially along the plane 4-4 of FIG. 3;

FIG. 5 is a top view of a method and apparatus for manufacture of the bag bundles of the present invention;

FIG. 5A is a side view of the method and apparatus of

FIG. 5, FIG. 5A including certain details not presented in FIG. 5;

5 FIG. 6 is a front perspective view of a first embodiment of a structure useful for supporting the first embodiment of the bag bundle of FIG. 1;

FIG. 6A is a front perspective view of a second embodiment of a structure useful for supporting the  
10 first embodiment of the bag bundle of FIG. 1;

FIG. 7 is a projected sectional view taken from the plane 7-7 in FIG. 5A; and

15 FIG. 8 is a projected sectional view taken from the plane 8-8 in FIG. 5A.

DETAILED DESCRIPTION OF THE ILLUSTRATED EMBODIMENT

20 A first embodiment of the bag bundle 10 (FIG. 1) comprises a plurality of (preferably from about 50 to about 100) joined, collapsed bags 12. The bags 12 are made of plastic and preferably have relatively thin walls.

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Each such bag 12 includes a first or forward sidewall 14 and a second or rearward sidewall 16 integral with the first sidewall 14 at lateral end portions thereof (FIGS. 2-4). Each such bag 12 further includes a  
30 bottom 18 formed by joining together the lower longitudinal end portions of the forward and rearward sidewalls 14, 16 along a transverse line 19 (FIG. 3).

Each such bag 12 yet further includes a mouth or opening 20 in distal relation to the bottom 18 (FIGS. 2, 3).

5 Each such bag 12 additionally includes a tab 24 (FIG. 1). As to each bag 12, the tab 24 is integral with first and second sidewall upper longitudinal and portions adjacent the opening 20 (FIG. 2). Such  
10 sidewall upper longitudinal end portion, more ver, is separable from its tab 24 because each such bag 12 further includes a linear perforated boundary or margin 26 (FIG. 1) for separating the bag 12 from the tab 24.

15 The sidewalls 14, 16 preferably include longitudinally-disposed inwardly-folded (or gusseted) integral side panels 22 (FIG. 4) at lateral end portions thereof.

20 Only one (preferably the forward sidewall 14) of the sidewalls 14, 16 includes a hand hole 28 (FIG. 3) formed through such sidewall 14, large enough for readily inserting the fingers of a hand of a grasper (FIG. 2) into the opening 20 intermediate the forward and rearward sidewalls 14, 16. The perforations of the  
25 boundary 26 are spaced such that when the tab 24 is held securely by the grasper a quick flip of the wrist (after the fingers have been inserted intermediate the forward and rearward sidewalls 14, 16) provides sufficient force for removing such a grasped bag 12  
30 from the tab 24. It is noted that the gusseted side panels 22 serve to space the sidewalls 14 and 16 from each other to facilitate inserting of the fingers into the opening 20 and behind the forward wall 14.

In the first embodiment of the bag bundle 10, the perforated margin 26 overlies an upper edge of the hand hole 28 (FIG. 1). Accordingly, when the user inserts his fingers through the hand hole 28 (of a bag 12) for the purpose of removing such a grasped bag 12 from the bundle 10 (FIG. 2), the hand hole 28 of the bag 12 (FIG. 3), now removed from the bundle 10, provides the bag 12 with a notch 29 (FIG. 33) along the upper longitudinal end portion of only the forward sidewall 14.

The inertia or attraction (electrostatic or otherwise) as between the forward and rearward sidewalls 14, 16, surprisingly, is readily overcome by a quick thrust of the fingers through the hand hole 28. For example, the fingers (thus thrust) initially separate upper portions of the forward and rearward sidewalls 14, 16, and subsequent downward disposition of the fingers permits the user to grasp the forward sidewall 14 (preferably along the hand hole 28) for removing the bag 12 from the tab 24 as above described.

The bags 12 of the first embodiment of the bag bundle 10 are joined together in a manner such that the tabs 24 are one atop another, and such that the hand holes 28 are uniformly disposed, i.e., preferably directed toward the user (FIG. 2).

The tabs 24 are fastened together preferably along an upper transverse line 30 (FIGS. 1, 2) located intermediate the perforated margin 26 and an upper edge of each tab 24, thereby forming the first embodiment of

the bundle 10. The tabs 24 of the first embodiment, moreover, include punched holes 32 preferably through spaced opposite end portions of the tabs joined 24, and further preferably centered on the transverse line 30  
5 for supporting the bundle 10 in a known manner using hooks 34 and a support structure 36 (FIG. 1). The hooks 34 are preferably fastened to the support structure 36 by screws 35.

- 10 A first embodiment of a structure 36A (FIG. 6) particularly useful for supporting the first embodiment of the bag bundle 10 comprises hooks 34A, a pair of legs 33A and a metal plate 37A for resisting rearward motion of the bundle 10 when a user thrusts a hand into  
15 the hand hole 28 as above described. The legs 33A are preferably mounted into a counter top 39 in an upright manner.

- A second embodiment of a structure 36B (FIG. 6A), also  
20 particularly useful for supporting the bag bundle 10, similarly comprises hooks 34A, a single leg 33B and a metal plate 37B serving a function similar to that of the metal plate 37A. The leg 33B similarly is preferably mounted into the counter top 39 in an  
25 upright manner.

- In a second embodiment (FIG. 1A) of the bag bundle 10A, the upper longitudinal edge portions of the forward and rearward sidewalls 14A, 16A respectively include a hand  
30 hole 28A and an arcuate tab 24A. The tab 24A, integral only with the rearward sidewall 16A, is separable from the rearward sidewall 16A along an arcuate perforated boundary or margin 26A.

Bags 12A (of the second embodiment of the bag bundle 10A) are stacked, one atop another, in a manner such that the tabs 24A are one atop another, and such that the hand holes 28A are uniformly disposed. The stacked  
5 tabs 24A, moreover, preferably include at least one hole 32A formed therethrough for supporting the bundle in 10A (substantially as described above, using a single hook 34). The tabs 24A are joined together preferably along the circumference of the holes 32A.

10 In a third embodiment (FIG. 1B) of the bag bundle 10B, the first and second sidewalls 14A, 16A further include elongated patches 41 (preferably plastic) which respectively have been affixed to the first and second  
15 sidewalls 14A, 16A intermediate the side panels 22. The patches 41 are located proximate to the hand hole 28A and tab 24A and are transversely disposed relative to the side panels 22.

20 The third embodiment further preferably includes a second hand hole 43 (FIG. 1B) formed through the first and second sidewalls 14A, 16A and centered on the patches 41. The second hand holes 43 are transversely disposed relative to the side panels 22, and serves as  
25 a means for carrying the bag 12B when such bag 12B has been removed from its bag bundle 10B and filled with merchandise. The patches 41 serve as a reinforcement for eliminating tearing of the sidewalls 14A, 16A. Accordingly, the thickness of the patches 41 is  
30 sufficient for accomplishing such a purpose.

Throughout the description of the three embodiments of

the bags 12, 12A and 12B and bag bundles 10, 10A and 19B, like reference numerals have been given to like parts.

5 The bags 12, 12A and 12B are preferably made of a relatively thin gauge plastic, and are preferably individually heat sealed at the transverse line 19 (FIG. 4) thereby providing each bag 12, 12A and 12B with its respective closed bottom 18. The bags 12, 12A  
10 and 12B of each respective bag bundle 10, 10A and 10B, moreover, are fastened together, using commercially available heat-welding apparatus, either along the line 30 or along the circumference of the holes 32A.

15 Method of and Apparatus for  
Manufacture of the Bag Bundles

The following discussion is specifically directed toward a method of and an apparatus for manufacture of the first embodiment (FIG. 1) of the bag bundles 10.  
20 Minor modifications to the method and apparatus (FIGS. 5, 5A) for manufacturing the second and third embodiments (FIGS. 1A, 1B) will also be briefly discussed.

25 Referring to FIG. 5, it will be seen that an extruder 38, which receives plastic material from a source (not shown), extrudes (step 1) a molten form of the plastic material. The extruded plastic material assumes the shape or form of a tube or sleeve 40. Feed rollers 42  
30 (within a tube-transfer station 45) transfer the extruded tube 40 from the extruder 38 to heat sealers 44. The feed rollers 42 of the tube-transfer station 45 serve to flatten the tube 40 as the tube is advanced

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past the heat sealers 44. The heat sealers 44 are spaced above and below the extruded tube 40, and are spaced transverse to the direction of travel of the extruded tube 40 so as to substantially equally divide (step 2) the extruded tube 40 into a plurality of (in FIG. 5, for example, 3) relatively narrower, longitudinally-joined tubes 46. The tubes 46 are then drawn past cutters 48 which cut (step 3) the tubes 46 along a margin or region 50 where such tubes 46 had been joined.

Advancing rollers 49 then advance individual tubes 46 (now severed one from another) through a tension-adjusting station 52 preferably comprising five rollers (FIG. 5A) so that each tube 46 can be punched on one side only (FIG. 5A: step 4).

Directing attention to FIG. 5A, it will be seen that within each tube 46 an internal mandrel 54 having an anvil 56 is supported within the tube 46 by support rollers 58. The internal mandrel 54 separates the walls of the tube 46, and changes the shape of the tube 46 from substantially flat (FIG. 7) to relatively open (FIG. 8). A punch 60, external to the tube 46, at predetermined time intervals strikes the mandrel anvil 56 forming the hand hole 28 through one side only of the tube 46 (see FIG. 5).

An indexing station 62 (preferably comprising three rollers) advances each tube 46 from its respective mandrel 54 to a folding station 64 where guiding vanes 66 (FIGS. 5, 5A) cause folds or gussets to be formed (step 5) in the lateral sides of each tube 46. (These

folds or gussets become the side panels 22 when the tubes 46 are later formed into bags 12, 12A or 12B.) The indexing station 62 serves to flatten the tubes 46 as they are drawn over their respective mandrels 54.

5 (As between FIGS. 5 and 5A, the tension-adjusting station 52, mandrels 54 and indexing station 62 are included within an area 63.)

10 With the lateral sides thus folded in, each tube 46 is advanced by advancing rollers 68 to heat sealers 70 and cutters 72. The function of the heat sealers 70 is to heat seal transversely-disposed, longitudinally-spaced portions of each tube 46, and the function of the cutters 72 is to cut (step 6) each such tube 46 along

15 these transversely-disposed, heat-sealed portions. Each such tube 46 is cut along a longitudinal end portion which is in distal relation to the hand hole 28. See FIG. 5.

20 (At this point it will be appreciated that the severed tubes 46, which have been cut along one longitudinal end thereof and which have been heat sealed at such longitudinal end, are thus being transformed into the above-described bags 12. Where the tubes 46 have been

25 sealed, for example, corresponds to the above-described transverse line 19.)

Severed tubes 46 are conveyed by a conveyer 74 from the heat sealers 70 and cutters 72 to a stacker 76 which

30 causes the severed tubes 46 to become stacked vertically (step 7). The advancing rollers 68 serve to advance the unsevered tubes 46 past the heat sealers 70 and cutters 72. The heat sealers 70 and cutters 72

Perform their respective functions upon the tubes 46 at predetermined time intervals. The advancing rollers 68, heat sealers 70 and cutters 72, moreover, cooperate in a manner such that a leading end portion of the  
5 unsevered tubes 46 is permitted to be advanced onto the conveyor 74 before the cutters 72 cut such leading end portions from the remainder of each tube 46.

When a predetermined quantity of severed tubes 46 have  
10 accumulated at the stacker 76, a leading longitudinal end portion of the severed tubes 46 are heat sealed together (step 8) at the transverse line 30 (FIGS. 1, 5) by a heat sealer 78 (FIGS. 5, 5A). A conveyor 80, which operates at predetermined time intervals in  
15 cooperation with the stacker 76, receives the severed tubes 46 from the conveyor 74 and permits a quantity (preferably from about 50 to about 100) to accumulate as to each pile of severed tubes 46 (there are 3 such piles; see FIG. 5) before advancing the stacks of tubes  
20 46 from the stacker 76 to the heat sealer 78. The conveyor 80 transfers the joined and severed tubes 46, now unfinished bag bundles 10, to a punch 82 which punches and cuts (step 9) the bag bundles 10, through the leading end portions thereof thereby forming the  
25 perforated boundaries or margins 26 and the tabs 24. The punch 82 preferably forms the linear perforated margin 26 when the apparatus (of the present invention) is used to form the first embodiment (FIG. 1) of the present invention. The punch 82, moreover, preferably  
30 forms the arcuate perforated margin 26A when the apparatus is used to form the second and third embodiments (FIGS. 1A, 1B). In addition to forming the perforated margins 26 and 26A, the punch 82 is used for

forming the holes 32 or 32A through the tabs 24 or 24A of the first or second and third embodiments of the bundles 10 or 10A and 10B of the present invention. Where two holes 32 are formed through the tab 24 (FIG. 1), such holes 32 are preferably spaced at opposite end portions of the transverse line 30 for additional support of the bag bundle 10 by the hooks 34.

As to the second and third embodiments of the bag bundle 10A and 10B, the punch 82, moreover, cuts each bag 12A or 12B at the upper or leading longitudinal edge 27 thereof (FIGS. 1A, 1B). As to the second and third embodiments of the bag bundle 10A and 10B, the punch 82 includes means for hot punching the tabs 24A together thereby forming the holes 32A whereby the tabs 24A are joined together at the circumferences of the holes 32A.

It will therefore be appreciated by those skilled in the art that certain steps of the above-described apparatus and method can be interchanged, modified or combined without deviating from the spirit and scope of the present invention.

What has been illustrated and described herein is a novel bag bundle. In addition, an apparatus and a method for producing such bag bundles has been illustrated and described. While the bag bundle method and apparatus of the instant invention have been illustrated and described with reference to several embodiments, the invention is not limited thereto. On the contrary, alternatives, changes or modifications may become apparent to those skilled in the art upon

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reading the foregoing description. For example, the method and apparatus as illustrated in FIGS. 5 and 5a show forming the hand holes and severing the tube at the leading margins of the bags, but in many instances, 5 it may be preferred to arrange the tooling so as to form the hand holes and sever the tube at the trailing end of the bags. Of course, the tooling at steps 7, 8 and 9 would be correspondingly relocated. Accordingly, such alternatives, changes and modifications are to be 10 considered as forming a part of the invention insofar as they fall within the spirit and scope of the appended claims.

15

**Claims:**

1. A bag bundle comprising a plurality of uniformly-disposed joined collapsed tubular plastic bags, each one of said plurality of plastic bags including a first front wall, a second back wall integral with the first wall at lateral end portions thereof, a closed bottom, an opening in distal relation to said bottom and an integral tab, said bottom being formed at a first longitudinal end portion of said first and second walls, said tab being formed in an opposite longitudinal end portion of said first and second walls, said tab being joined to said first and second walls along a perforated margin adjacent said opening, only said first front wall of each one of said plurality of bags having an unobstructed hand hole of substantial width and height therethrough from which material of said front wall corresponding to said hole has been removed proximate to said respective tab for inserting a hand into said respective hole of one of said plurality of bags, said respective tabs of adjacent ones of said plurality of bags being joined together in a manner such that said bags are stacked and such that said hand holes are uniformly disposed for successive removal of one of said plurality of bags from the bundle and so that the hand hole of each successive bag will be completely uncovered and unobstructed upon removal of a preceding bag.

2. The bag bundle of claim 1 further including a

spaced pair of integral, inwardly-folded, longitudinally-disposed gussets joining said first and second walls at said lateral end portions thereof.

3. The bag bundle of claim 1 wherein said tab of each respective one of said plurality of bags includes a hole therethrough for supporting said bag bundle.

4. The bag bundle of claim 1 wherein said tab of each respective one of said plurality of bags includes a spaced pair of holes therethrough for supporting said bag bundle.

5. The bag bundle of claim 1 wherein each one of said plurality of bags includes hole means through said first and second walls proximate to said respective opening for carrying said one of said plurality of bags.

6. The bag bundle of claim 5 further including affixed reinforcing means surrounding said hole means for reinforcing the first and second walls of each respective one of said plurality of bags at said respective hole means.

7. A method of forming a uniformly-disposed, joined bag bundle from a collapsed plastic tubular member, said tubular member defining a first wall and a second wall joined along lateral end portions thereof to said first wall, comprising: forming through only said first wall of said tubular member an open unobstructed hand hole of substantial height and width by complete removal of material conforming to the hand hole from

said first wall; severing from said tubular member a tube, said tube including said hand hole proximate to a first longitudinal end portion thereof; sealing an opposite longitudinal end portion of said tube thereby forming a bag from said tube, said bag including a first sidewall, a second sidewall integral with said first sidewall at lateral end portions thereof, a sealed bottom and an opening in distal relation to said bottom; stacking a plurality of said bags so that the respective hand hole of each one of said plurality of bags is uniformly disposed relative to the hand hole of an adjacent one of said plurality of bags; affixing said plurality of bags together along a margin intermediate the opening and the hand hole of each respective one of said plurality of bags; forming perforations through said first and second sidewalls intermediate said margin and said hand hole of each respective one of said bags for removing each respective one of said plurality of bags from the remainder of said plurality of bags; and forming at least one support hole through said one of said first and second sidewalls which includes said perforations, said support hole being proximate to said margin and intermediate said perforation and said opening of each respective one of said plurality of bags.

8. A stack of bags respectively comprising a collapsed plastic tube including a first front wall, a second back wall, a spaced pair of integral inwardly folded longitudinally disposed gussets joining said first and second walls along lateral margins thereof, a closed bottom at a first longitudinal end portion of said first and second walls, an open upper end defined by

end edges at a second longitudinal end portion of said first and second walls opposite from said bottom, and only one of said walls having an unobstructed hand hole therethrough defined by an edge intersecting said end edge of said one wall, the material of said one wall corresponding to said hand hole being completely removed for facilitating entry of the hand of a user and removal of a bag from the stack, the other of said walls having uninterrupted material thereof traversing said hand hole, said bags being disposed in the stack in the same orientation with their hand holes in alignment so that upon removal of each bag from the stack the hand hole of a successive bag will be completely uncovered for facilitating successive removal of all bags from the stack.

